Amendments to the Drawings:

The attached sheets of formal drawings replace the previously submitted informal drawings. No new subject matter has been added by the submission of these formal drawings.

Attachment: Replacement Sheets (7 pages)

REMARKS

The Applicant respectfully requests reconsideration of this application in view of the following remarks. In this response, claims 1, 3, 11-13, 16-17 and 19 have been amended. Claims 4, 26-29 and 32-33 have been cancelled. And, fourteen new claims, claim 34-47 have been added. Hence, upon entry of this amendment, claims 1-3, 5-25, 30-31 and 34-47 are presented for examination.

Claim Rejections – 35 U.S.C. § 102
Raja

In the Office action, the Examiner rejected claims 1-2, 4-5, 9-12, 14, 16-19, 21-22 and 26 under 35 U.S.C. 102(e) for allegedly being anticipated by US Patent No. 6,286,,049 of Rajakarunanayake et al. (hereafter "**Raja**"). The undersigned respectfully disagrees with the Examiner's characterization of Raja and points out several distinctions between the claimed subject matter and the teachings of Raja.

As an initial matter, the undersigned agrees with the Examiner's conclusions regarding the following deficiencies of Raja:

- "[Raja] fails to discloses [*sic*] the communications over the Internet is via an Internet protocol security (IP Sec) tunnel." (pg. 9 of the Office action).
- "[Raja] fails to discloses [*sic*] a data link connection identifier (DLCI) to provide routing information to establish a communications link between the first user and the second user." (pg. 10 of the Office action).
- "[Raja] fails to disclose the system further comprises of a customer network manage [*sic*] system to permit subscribes [*sic*] to monitor service status, generate repots [*sic*] and forecasts for network planning and service modification."

As presently understood by the undersigned, Raja generally relates to the provision of broadband content with layer 4-7 switching to high-speed access subscribers (see Abstract). The disclosed system includes an enhanced services complex (ESC) 262 having at

least one content server with Internet content stored or cached therein (see Abstract and Fig. 3). A Broadband access Gateway 260 interposed between the ISP 134 and the ESC 262 selectively routes data traffic from the CPE 110 at a client premise to an ESC content server or the SIP based upon a destination address associated with the client data packet (see Abstract, Fig. 6, and col. 10, ll. 58-67). Notably, ***Raja does not teach or reasonably suggest transmission of frame relay messages over the Internet***. While the Examiner's stated position at pg. 3 of the Office action that "routing data between CPEs over the Internet is [*sic*] inherent feature," given the ***focus of Raja*** being ***retrieval of Internet content by CPE***, it is respectfully submitted that it is not inherent that the subscribers communicate among each other via their respective CPE. The undersigned finds no teaching, suggestion or contemplation in Raja that the CPE communicate with each other at all let alone over the Internet. See Fig. 3 where it is shown that CPE 110 are making requests for Internet content 150. To the extent the CPE of Raja do communicate over the Internet or such communication is inherent as suggested by the Examiner, there is no teaching or suggestion that such communication be in the form of frame relay information encapsulated within User Datagram Protocol (UDP) packets.

With this brief overview of Raja in mind, the undersigned now submits the following arguments to point out significant differences between the invention as claimed by the Applicant and Raja.

Briefly and by way of background, embodiments of the present invention involve Internet Protocol service switches (IPSXs) having a particular architecture. Each IPSX includes a subscriber virtual frame relay switch (VS), a virtual router (VR), a firewall and an Internet Protocol Security (IPSec) module. The IPSXs encapsulate frame relay header and payload information of a frame relay message within a payload transport protocol and encrypt and authenticate all packets of the payload transport protocol to facilitate secure communication of frame relay messages among multiple subscriber terminals over the Internet.

Regarding independent claim 1, as amended, Raja does not teach or reasonably suggest the specific IPSX architecture or "at least one subscriber virtual frame relay switch (VS) ... configured to facilitate ***secure communication of frame relay messages from the first user terminal to a second user terminal over the Internet***" in the manner recited. As explained

above, the disclosure of ***Raja is focused on retrieval of Internet content 150 by subscribers*** via their respective CPE 110. Raja provides layer 4-7 switching and content caching within the ESC 262, but ***does not describe communication among the CPEs 110***. As a result, Raja does not teach or reasonably suggest communication over the Internet let alone the required communication, encapsulation, encryption and authentication of frame relay messages over the Internet. For at least this reason, independent claim 1 and its dependent claims, which add further limitations, are thought to be clearly distinguishable over the teachings of Raja.

Regarding dependent claim 5, Raja does not teach or reasonably suggest the recited "***switch-to-switch signaling protocol to communicate signaling*** and other ***information between*** [virtual switches]" (emphasis added). To support his position regarding the existence of a switch-to-switch signaling protocol in Raja, the Examiner indicates "the connection-oriented packet network i.e. ATM or Frame Relay establishes Virtual Circuits between the switches" (citing the Background of Rata at col. 1, ll. 37-45). First, the Examiner mischaracterizes the relied upon portion of ***Raja*** as the relied upon portion ***does not relate to Virtual Circuits (VCs) between switches, but rather VCs "between each client and the ISP*** to which the corresponding client subscribes" (emphasis added). Second, the Examiner has not explained how such VCs equate or even relate to a "switch-to-switch signaling protocol." For the convenience of the Examiner, the undersigned points out in the context of the present application, the switch-to-switch signaling protocol is described in paragraph [0020] as complementing and operating in parallel with the payload transport protocol. The switch-to-switch signaling protocol also is described as providing periodic synchronization among the virtual switches 110, being used to communicate status information about the different components within the system and to announce and set up the creation of new components or DLCIs for future service. While the virtual circuits described in background of Raja presumably are used to transport Internet content 150 from the Internet to the subscriber via the ATM network 230, there is no indication in the portion of Raja cited by the Examiner that the VCs "communicate ***signaling*** and other ***information***" (emphasis added) between VSs. For at least this additional reason, claim 5 is thought to be patentably distinguishable over the teachings of Raja.

Regarding dependent claim 11, Raja does not teach or reasonably suggest the recited "sequence number" contained within "each frame ... to preserve the order of the frames." In support of the Examiner's position that Raja anticipates this claim, the Examiner merely indicates at pg. 5 that "[Raja] inherently discloses information is transferred between users in frames, each frame containing a sequence number to preserve the order of the frames." As indicated above, the undersigned firstly respectfully objects to the Examiner's *assumption* that frames are communicated among the ISP subscribers of Raja. There is no absolutely no suggestion in Raja that the ISP subscribers exchange frame relay information. Rather, every packet exchange described in Raja is in the context of ISP subscribers either sending requests for Internet content 150 or receiving Internet content 150. Secondly, simply because Raja indicates at col. 9, ll. 1-13 that "***data*** to be transmitted over a packet network ***is divided into numerous packets***" (emphasis added) ***does not teach or suggest frame sequence numbers***. The recited frame sequence numbers are separate and apart from any sequence numbers the Examiner attributes to the packets. As an example of what is meant by recited frame sequence number, the Examiner is respectfully directed to paragraph [0031] of the present application where the frame sequence number is clearly described as being part of the payload of the IP datagram encapsulation. For purposes of clarification, the undersigned proposes herein an amendment to claim 11 to call out specifically the location of the frame sequence number. For at least this additional reason, claim 11 is thought to be distinguishable over the teachings of Raja.

Regarding independent claim 12, as amended, it includes limitations similar to those discussed above with reference to claim 1. For example, claim 12 requires a specific IPSX architecture and "***secure frame relay communications between the user terminals*** associated with each of the routers ***over the Internet***" (emphasis added). Consequently, the various of the arguments presented above with reference to claim 1 are thought to be applicable with respect to claim 12; and claim 12 and its dependent claims, which add further limitations, are thought to be distinguishable over Raja.

Regarding dependent claim 14, the Examiner points to Fig. 5 of Raja to support his conclusory remark that "[Raja] discloses a payload transport protocol for communicating frame relay information between the VSs." As indicated above, ***there is simply no teaching or***

suggestion in Raja that frames are exchanged among the ISP subscribers. Fig. 5 of Raja simply illustrates a simplified logical view of a typical IP packet payload and header. There is absolutely no suggestion in Raja that frame relay information be included within the payload (i.e., data 302) of the packet shown in Fig. 5, which is described in Raja at col. 9, ll. 2-52. For at least this additional reason, claim 14 is clearly distinguishable over Raja.

Regarding dependent claim 16, the Examiner make another unsupported statement that "[Raja] discloses the transport protocol is based on user datagram protocol (UDP/IP)" citing Fig. 5. It is respectfully submitted that Fig. 5 makes no reference to UDP and neither does the corresponding description of Fig. 5 at col. 9, ll. 2-52. For at least this additional reason, claim 16 cannot be anticipated by Raja.

Regarding dependent claim 17, the Examiner mischaracterizes the teachings of Raja yet again indicating "[Raja] discloses he [*sic*] frame relay protocol is encapsulated in a frame relay over Internet Protocol (FOIP) header that is then encapsulated in UDP (FRAME RELAY protocol (layer 2) may be use [*sic*] in place of ATM protocol (known in the art as layer 2 protocol) and transmit [*sic*] over the Internet 136 using IP protocol (known in the art as layer 3 protocol)" citing Fig. 3 and col. 5, ll. 14-17. The undersigned respectfully submits Fig. 3 of Raja illustrates ATM packets may be communicated from the CPEs 110x and the ATM switches 232. However, the requests to the ISPs 134x are presumed by the undersigned to be traditional IP packets. An electronic search of Raja confirms there is not a single reference to "encapsulation" or "FOIP" anywhere in the specification, claims or figures. Meanwhile, the only reference to "UDP" in Raja is at col. 6, ll. 23-25 in which Raja states "[a]s known in the art, layer 4-7 correspond to layers relating to the content, namely, transport (e.g., TCP or UDP), session, presentation and application layers, respectively." This single mention of UDP is hardly a teaching or suggestion that frame relay information be encapsulated in UDP for transmission over the Internet as alleged by the Examiner. The undersigned respectfully requests the Examiner to reconsider his rejection in view of the lack of evidence to support his position.

Regarding dependent claims 21 and 22, the Examiner again relies on a flawed inherency argument to support his positions that the claim language is anticipated by Raja. Despite the Examiner's suggestion with respect to claim 21 that "[Raja] inherently discloses the

system comprises of an operations support system (OSS), the OSS establishing a permanent virtual circuit (PVC) between each of the user terminals in a virtual private network (VPN)," the undersigned respectfully points out that Raja makes no mention of an operations support system (OSS) or a VPN anywhere in the specification, claims or figures. Meanwhile, the PVCs described in Raja are "established ***between*** each ***CPE*** 110 ***and*** the corresponding ***ISP*** 134" (emphasis added, see col. 8, ll. 29-30) not, as the Examiner suggests between user terminals. Consequently, for these additional reasons, claims 21 and 22 are thought to be further distinguishable over Raja.

Claim Rejections – 35 U.S.C. § 102
Sasson

The Examiner rejected claims 30-32 under 35 U.S.C. §102(e) as being allegedly unpatentable over US Patent No. 6,798,785 of Sasson et al. (hereafter "Sasson"). The undersigned respectfully disagrees with the Examiner's characterization of Sasson.

As presently understood by the undersigned, Sasson describes various interworking function (IWF) scenarios and protocol data unit (PDU) formats for handling Frame Relay, including "Network Interworking" and "Service Interworking," but does not teach or suggest a particular physical location or implementation of an IWF (see col. 3, l. 66 to col. 4, l. 5; and col. 3, ll. 36-62).

Regarding independent claim 30, as amended, Sasson does not teach or reasonably suggest the IPSX as recited. The first IPSX of claim 30 requires "a subscriber virtual frame relay switch (VS) coupled to the first subscriber terminal, a virtual router (VR) to connect the VS to the Internet through a firewall and an Internet Protocol Security (IPSec) module." As indicated above, while Sasson admittedly illustrates various IWF scenarios and PDU formats, it lacks any teaching or reasonable suggestion with respect to the switch architecture now required by claim 30. For at least this reason, claims 30-32 are distinguishable over the teachings of Sasson.

Claim Rejections – 35 U.S.C. § 103
Raja in view of Ylonen

The Examiner rejected claims 3, 13 and 27-28 under 35 U.S.C. §103(a) as being allegedly unpantentable over Raja in view of US Patent No. 6,438,612 of Ylonen (hereafter "**Ylonen**"). The undersigned respectfully disagrees with the Examiner's characterization of the individual and combined teachings of Raja and Ylonen.

As an initial matter the undersigned respectfully questions the motivation to combine Raja and Ylonen. As indicated above, Raja does not teach or suggest ISP subscribers communicating over the Internet. Meanwhile, the CPE 110x, the DSLAM 122x, the ATM switches 232 and the ESC 262 are all part of or interface with an ATM network. Consequently, the only two nodes of Raja that could even be involved in an IPSec tunnel would be Broadband Access Gateways/Routers BAGs 260 and ISPs 134x. The undersigned questions the need for secure communications directly with an ISP. Meanwhile, to the extent the combination of Raja and Ylonen makes sense at all, the combination does not yield the claimed invention as the combination would simply lead to lines 254x in Fig. 3 being secure tunnels.

As understood by the undersigned, the Examiner relies on Ylonen solely for its alleged teachings regarding "two nodes communication [*sic*] over the Internet is via an Internet protocol security (IP Sec) tunnel" citing col. 2, l. 60 to col. 3, line 30. The Examiner does not indicate Ylonen is thought to teach or suggest the specific IPSX architecture or the other limitations of claims 1 or 12 shown above to be missing from Raja. Meanwhile, the undersigned has found no such teachings or suggestions in the disclosure of Ylonen. Consequently, in view of Ylonen's failure to address the deficiencies of Raja pointed out above, the combination of Raja and Ylonen remain deficient with respect to at least the recited IPSX architecture required by claims 1 and 12. Thus, the combination of Raja and Ylonen, to the extent properly combinable, would not and could not produce the Applicant's claimed invention as recited by dependent claims 3 and 13, which properly depend from independent claims 1 and 12, respectively. For at least this reason, claims 3 and 13 are thought to be distinguishable over the combination of Raja and Ylonen.

Claim Rejections – 35 U.S.C. § 103
Raja in view of Watt

The Examiner rejected claims 6-8, 15, 20, and 23 under 35 U.S.C. §103(a) as being allegedly unpatentable over Raja in view of US Patent No. 5,781,532 of Watt (hereafter "**Watt**"). The undersigned respectfully disagrees with the Examiner's characterization of the individual and combined teachings of Raja and Watt.

As an initial matter the undersigned respectfully questions the motivation to combine Raja and Watt. As indicated above, Raja does not teach or suggest ISP subscribers communicating over the Internet. Consequently, it makes no sense to "provide routing information to establish a communications link between the first user and the second user" in the context of Raja as suggested by the Examiner at pg. 10 of the Office action. Meanwhile, the undersigned objects to the Examiner's remarks regarding motivation to combine at pg. 11 of the Office action indicating "[t]herefore, it would have been obvious … includes [sic] the teaching of Watt in the system taught by [Raja] for providing bandwidth fairly between active conversations" as inaccurate, conclusory and boilerplate in nature.

As understood by the undersigned, the Examiner relies on Watt solely for its alleged teachings regarding a data link connection identifier (DLCI). The Examiner does not indicate Watt is thought to teach or suggest the specific IPSX architecture or the other limitations of claims 1 and 12 shown above to be missing from Raja. Meanwhile, the undersigned has found no such teachings or suggestions in the disclosure of Watt. Consequently, in view of Watt's failure to address the deficiencies of Raja pointed out above, the combination of Raja and Watt remain deficient with respect to at least the recited IPSX architecture required by claims 1 and 12. Thus, the combination of Raja and Watt, to the extent properly combinable, would not and could not produce the Applicant's claimed invention as recited by dependent claims 6-8, 20 and 23, which all properly depend from either independent claim 1 or 12. For at least this reason, claims 6-8, 20 and 23 are thought to be distinguishable over the combination of Raja and Watt.

Claim Rejections – 35 U.S.C. § 103
Raja in view of Estberg

The Examiner rejected claims 24-25 under 35 U.S.C. §103(a) as being allegedly unpantentable over Raja in view of US Patent No. 6,148,337 of Estberg et al. (hereafter "**Estberg**"). The undersigned respectfully disagrees with the Examiner's characterization of the individual and combined teachings of Raja and Estberg.

As an initial matter the undersigned respectfully questions the motivation to combine Raja and Estberg. As indicated above, Raja neither (i) reaches or suggests ISP subscribers communicating over the Internet nor (ii) use of a frame relay VPN. Consequently, it makes no sense to combine Raja with the alleged customer network management system for network planning and service modification of a VPN. Meanwhile, the undersigned objects to the Examiner's remarks regarding motivation to combine at pg. 11 of the Office action simply indicating "[t]herefore, it would have been obvious ... includes [*sic*] the teaching of *Estberg* in the system taught by [Raja] in order provides [*sic*] the VPN subscribers with ability performs [*sic*] limited network management functions" (emphasis in original) as unintelligible, inaccurate, conclusory and boilerplate in nature.

As understood by the undersigned, the Examiner relies on Estberg solely for its alleged teachings regarding a "customer network manage [*sic*] system" to allegedly perform the functions of claims 24 and 25. The Examiner does not indicate Estberg is thought to teach or suggest the specific IPSX architecture or the other limitations of claim 12 shown above to be missing from Raja. Meanwhile, the undersigned has found no such teachings or suggestions in the disclosure of Estberg. Consequently, in view of Estberg's failure to address the deficiencies of Raja pointed out above, the combination of Raja and Estberg remains deficient with respect to at least the recited IPSX architecture required by claims 1 and 12. Thus, the combination of Raja and Estberg, to the extent properly combinable, would not and could not produce the Applicant's claimed invention as recited by dependent claims 24-25, which all properly depend from independent claim 12. For at least this reason, claims 24-25 are thought to be distinguishable over the combination of Raja and Estberg. For at least this reason, claims 24-25 are thought to be distinguishable over the combination of Raja and Estberg.

New Claims

Three new claims, i.e., claim 34, 35 and 47, has been added. No new matter has been introduced by this new claim. The newly added independent claims is thought to be allowable over the references of record for at least various of the reasons presented above with reference to claims 1 and 12.

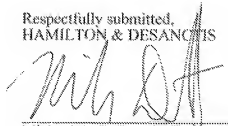
Conclusion

Applicant respectfully submits that the remark has overcome the rejections, and that the pending claims are in condition for allowance. Accordingly, Applicant requests that the rejections be withdrawn and that a Notice of Allowance be issued for claims 1-3, 5-25, 30-31 and 34.

Request for a Telephone Interview

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-284-5103.

Respectfully submitted,
HAMILTON & DESANCTIS



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